CERAMIC COMPOSITIONS FOR THERMAL BARRIER COATINGS STABILIZED IN THE CUBIC CRYSTALLINE PHASE

ABSTRACT

[0035] Zirconia-containing ceramic compositions that are capable of providing thermal barrier coatings wherein the zirconia is stabilized in the cubic crystalline phase. These compositions comprise at least about 50 mole % zirconia and a stabilizing amount up to about 49 mole % of a stabilizer component comprising: (1) a first metal oxide selected from the group consisting of ytterbia, neodymia, mixtures of ytterbia and neodymia, mixtures of ytterbia and lanthana, mixtures of neodymia and lanthana, and mixtures of ytterbia, neodymia and lanthana in an amount of from about 5 to about 49 mole % of the composition; and (2) a second metal oxide selected from the group consisting of yttria, calcia, ceria, scandia, magnesia, india and mixtures thereof in an amount of about 4 mole % or less of the composition. The ceramic composition further comprises one or more of a third metal oxide selected from the group consisting of: (a) hafnia in an amount from about 0.5 to about 40 mole % of the composition; and (b) tantala in an amount of from about 0.5 to about 10 mole % of the composition. These compositions are useful in preparing thermal barrier coatings for an underlying substrate of articles that operate at, or are exposed to, high temperatures.